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LAMENESS IN THE HORSE, WITH SPECIAL REFERENCE TO SURGICAL SHOEING*

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When your society asked me to talk on lameness and surgical shoeing someone must have known of my great interest in this matter.

To study a lame horse, to arrive at a diagnosis, to be able to prescribe a line of treatment which will give relief gives me the same type of pleasure as is no doubt experienced by a detective when he solves successfully one of his problems. It is a good rule to search for the obvious rather than to waste time meandering after the obscure. This statement applies to any branch of veterinary endeavour. I have been comforted and encouraged by the knowledge that the great majority of our problems are simple ones with an obvious cause and that most would resolve without professional aid. Bearing this in mind, there are two or three facts which experience impels me to accept. (1) Most lame horses are lame because of some lesion in or below the knee or the hock. (2) In fore-limb lameness the cause in most instances is sited in the foot. (3) In hind-limb lameness the hock is the part most commonly affected. (4) In most lame limbs you can find some structural and often some physiological change from the normal. By this I do not mean the changes which have been the direct result of the diseased state, but rather some older, it may be congenital, deviation from a normal standard. For instance, horses which are of good make and shape and well planted are not so likely to develop ringbones, sidebones and other lesions as are those whose conformation is at fault. (5) Many cases of lameness can be relieved by alterations in the method of shoeing and by suitable preparation of the hoof.

It is interesting to speculate why the fore feet and the hocks should be so often the seat of lameness. It is said that the fore feet have to bear most of the weight and they are subject to great concussion. The hind feet do not bear as much weight, but they are subject to great strain and concussion, so why do they escape trouble? The hock is said to suffer because it is the main axis in the propelling limbs and thus is subject to great strain. If this was a cogent reason for the frequency of hock trouble then would not all cart horses be lame in the hock? What about the cow? Lots of cows have spavins, sometimes of great size; their hocks often show extensive arthritic change, yet their hocks are not subjected to any undue or unnatural strain. I think that we must go beyond these time-honoured reasons for an explanation. In my view there is a more subtle explanation, one which is based on structural and physiological grounds. The hind feet escape many of the ills which beset the fore feet because they are built to a sounder mechanical specification. They are more compact, they have a better and stronger arch or dome in the sole, they have a deeper and stronger heel and the frog is more compact, and does not make contact with the ground to the same extent as does its fellow in the fore limb.

The well-being of any tissue depends on its conformation and strength and these two factors rule the efficiency of physiological function. Let us turn our attention to the fore feet. Big open feet have been an obsession of horsemen and breeders for generations and they have used their knowledge of selective breeding in order to satisfy their own whims and those of the judges in the show ring. I remember seeing the shoes of Carlton Banker, the first Shire horse to be sold for 1,000 guineas. These shoes would have made a tyre for the wheel of a small cart. Carlton Banker died after a severe attack of laminitis. Not content, breeders have also tried to alter the form and shape of the pastern. They have encouraged it to slope to such an extent that if this continues for a few more generations the blacksmiths will have to fit eight shoes instead of four, for they will certainly have to do something to protect the ergot. In making these feet wide and big and abusing nature look what our breeders have done. The toes, quarters and heels are so wide that the sole has lost its arch or dome just as a bridge would do if one moved the piers outwards. The heels have become so low that in many cases the hair line almost touches the ground. The frogs have been encouraged to grow and expand and been given an importance far beyond any necessity. The best one can say about such frogs is that they have become good pin-cushions for picked-up nails. Such hoofs and frogs are better designed for life on a bog than for hard work on our modern roads. It is strange that the belief in these distortions of the foot has persisted amongst horsemen when nature has placed before them a living example of the benefits of a more compact structure, a foot which is built upon the sound architectural plan of a hind foot. I refer to the foot of a mule, donkey, or small pony. Apart from gross injury, how often are such feet troubled with the ills which beset those of their more noble friend. Navicular disease is very rare in the hind foot of a horse and I have never seen it in a mule.

Why should we glorify a large frog and stress its anti-concussion, anti-slip qualities? Such a conception is nonsense. It ignores nature's ability to conform to environment and circumstances. It is the quality of the horny frog which matters, not its size. Many horses with small frogs, even frogs which do not make much contact with the ground, have feet which are A1 both structurally and functionally and do not slip. The true function of the frog is to act as a piston within the cylinder of the hoof. This piston effect is exercised in particular upon the venous circulation within the foot and impels this blood on the first stages in its return to the heart. If this pump mechanism be inefficient venous congestion results, a congestion which is accentuated by an absence of valves. Congestion is the

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first stage of inflammatory reaction and a congested foot is more liable to register the effects of injury from external causes such as concussion. Another factor is also at work, for the foot with a low weak heel allows the heel of the os pedis and also the navicular bone to descend. This will cause undue bending or kinking of the plantar vessels and the result will be more interference with the circulation. A state of chronic passive congestion is precipitated. Now many feet being in a state of chronic passive congestion do pass to the stage of inflammation which may be acute or chronic in character. Pain, heat and lameness may be the sequel. The acute case may offer no difficulty in diagnosis, it is the mild but persistent type which gives trouble in this way. This state of chronic inflammation, although it is primarily centred in the soft structures, often extends deeper and involves the periosteum and even the bone of the os pedis. When it does a state of " pedal ostitis " exists. This is probably the commonest cause of lameness in the riding or harness horse. If we examine the os pedis from such a case, evidence of inflammatory reaction is manifested by excessive roughness, the presence of small osteophytes, areas of rarefaction and even absorption of bone. The wings and the laminal border appear to be affected most. A clinical examination may reveal that the horse will go short and tender, especially so if he be asked to pass over rough ground or over some gravel cast on a hard surface. At rest the horse may stand perfectly level and not point, but on many occasions I have noted that the feet rock slightly from toe to heel and the shoe will show wear at these spots. There may or may not be heat, but the sole is always painful on percussion. Many of these cases are mild in character and as the horse warms up sound with exercise they are kept at work. If this continues for long, changes in the external contour of the hoof occur, the sole tends to flatten, the toe to lengthen, the heels to draw in, and the shoe will wear abnormally at heel and toe. Navicular disease may be present, for pedal ostitis and navicular disease often go together. It is my opinion that circulatory dysfunction is one of the prime factors in navicular disease. When one considers the delicate little vessels on which this bone depends for its nutrition and health it is obvious that circulatory disturbance can be effected with relative ease. When in doubt *re* pedal ostitis in clinical examination a radiograph of the foot may be of considerable value. The best pictures are taken with the foot in the navicular position. Inflammatory products obscure the fine details of bone structure, osteophytes are shown as dense white dots for they are caught end on, the laminal border loses its even contour—it may be very ragged and there may be great indentations indicating that bone has been absorbed.

What remedies can one apply? I base my treatment on these lines:—

(*a*) Restore the normal stance of the foot.

(*b*) Stimulate the circulation and nutrition of the part.

(*c*) Take immediate steps to relieve sole and frog pressure and so diminish pain.

I consider that it is essential to trim or manicure the hoof. Shorten and lower the toe. Leave the quarters and heels alone, *i.e.*, attempt to make the horse walk on the end of the toe of his os pedis. Now shoe with a shoe which has a bent toe, *i.e.*, a Blenkinsop or Cherry toe. Let the branches have plenty of cover and rise gently to the heels in order to raise the frog from the ground. By elevating the heel we straighten the pastern, raise the wings of the os pedis and eliminate any kinks in the digital and plantar vessels. Incidentally this lessens the tension at the fetlock, over the navicular bone and on the tendons. Many horses will go freer and with a longer stride as soon as such shoes have been fitted. It is as if one had applied a lubricant to a dry part of a machine. At subsequent shoeings pay particular attention to the manicuring of the hoof. By judicious manicuring a hoof may be trained to grow in almost any desired shape. You all know what can be done with the human finger or toe nail and the same principles hold good for the horse's hoof for they are both built upon the same basic plan. If your own nail should " grow in at the quick " the remedy is to cut or file it across its distal centre. If this does not have the desired effect then cut a V-shaped wedge out of the centre. In similar manner when dealing with a horse's hoof, if you shorten the toe the heels will grow deep and the bars strong, the sole will rise and contracted heels will widen automatically. Many of the foot troubles of horses are due to the reluctance of the farrier to take any horn off the toe. The modern theory that one should remove as little horn as possible has been pushed to extremes and the indifferent smith shelters behind it. In the day of the carriage horse the preparation of the hoof attained to the status of a fine art. The return to normal contour of the hoof can be accelerated by attending to the nutrition of the horn. Cod-liver oil exerts a great influence on the skin and the hoof is modified skin. I give cod-liver oil in the food and also apply it topically to the coronet. Within three weeks there is evidence of its effect. New horn of good colour and consistency can be observed at the coronet. Growth is accelerated and the manicuring operations can be repeated with greater frequency. A commercial firm have a stud of Shires and Suffolks of which they are very proud: the harness room walls are covered with red tickets won at shows. Stable management is good and expense is not spared. Foot troubles were the only serious trouble in this stud and a few years ago the position became so bad that it interfered seriously with showing and also with the normal work of the stud. They were advised to give the horses a breakfast-cupful of cod-liver oil every day in the food. Within three months their troubles had ceased and now it would be difficult to find a better lot of feet.

This method of altering the contour of the hoof by specific attention to the toe may seem revolutionary to some. I was tutored in the opposite view, *i.e.*, lower the heels, promote frog pressure and the heels will widen. They do widen, but it is at the expense of the sole, for it loses its arch or dome and becomes flat. It was a shrewd Arab dealer who initiated me into the toe theory. I had treated an Arab stallion affected with severe laminitis. The animal and its owner had covered 150 miles without respite. When the acute stage subsided the animal was left with great misshapen feet and very badly dropped soles. He was useless as a rider and his owner, the renowned Colonel Leechman, asked me if I would mind if his Arab dealer friend attempted a cure, for he was assured that the Arab could make the feet normal again. We adjourned to the dealer's yard. He simply cut off a great part of the toe. A month or two later the change was remarkable and ultimately two normal feet replaced the previous frightful mess.

Navicular Disease.—The type of foot which by tradition is associated with navicular disease is the end result of nature's efforts to relieve or cure. It is my opinion that if a young horse possessed feet of the "blocky " design of the established navicular foot he would most probably never suffer from the disease. The most susceptible type is almost the exact opposite in shape and design. It is the wide open foot with low heels and little or no arch

in the sole. It is met with most frequently in the half- or three-quarter-bred hunter—the horse which attempts to reproduce the shape, vim and activity of his aristocratic thoroughbred sire but retains the coarse head and feet of his plebeian dam. Such feet are out of balance with the rest of the body. They are liable to circulatory dysfunction and their most vulnerable part, the sole, is widely exposed to damage. No doubt there are cases of navicular disease which are the direct result of trauma. How else can we explain the cases in which the onset is sudden? A horse may go lame, acutely and suddenly lame, when being hacked home after a day's hunting. By next morning the acute symptoms may have subsided, he may be sound. As the days pass, his stride gets shorter and shorter, he will come out in the morning quite stiff and " pottery " and gradually and progressively he becomes a classical case of navicular disease.

Apart from such cases I am of the opinion that most cases of navicular disease are, like pedal ostitis, of a nutritional origin consequent upon local circulatory upset. The foot most prone to navicular disease is badly designed to withstand the stress of fast hard work and because of this poor design the circulatory system cannot function efficiently and reacts readily to the sudden and varying demands made upon it. The diagnosis of the disease is not easy in the early stages. This is unfortunate, for treatment then may relieve the symptoms; it may arrest the progression of the disease and, in spite of generally expressed opinion, I believe that on occasion resolution may occur. I have seen many navicular bones on which there were healed lesions. In trying to arrive at a diagnosis I take into account age, the hoof, the wear on the shoe and the gait. As a rule the horse must be over four or five years old; the hoof is the type I have previously described and even in the early stages the wall will show a " waist " mid-way between coronet and shoe. At that time the shoe will show undue wear at the toe; in the later stages it will wear so evenly that the shoe may be reduced to the thinness of a sixpence all over. The gait is probably the most helpful symptom or sign. Even early on a trained eye will note a lack of flexion below the pastern. Later the part below the fetlock is moved as one solid block. When trotted downhill the lameness is accentuated; going uphill the horse will " catch " his toe. Another aid to diagnosis is to attach a block of hard wood to a piece of hoof iron. Insert the iron under the heels of the shoe so that the block rests under the frog, then trot the horse. To give relief I think that we should take stock of what nature has done to the foot in the confirmed old case. To relieve pressure on the navicular area the heel grows deeper, the frog is raised and atrophied, the toe is shortened and the typical " blocky " foot results.

I have made attempts and with some success to follow these principles when trying to relieve an early case. Much can be done with the help of a competent farrier. Shorten the toe as much as possible, leave the quarters and heels alone. Then apply a shoe with the toe bent at about 120°. Keep the branches of the shoe as narrow as possible so that pressure is taken only on the wall and let these branches gradually deepen to the heel so that the foot is well set up and pitched towards the toe. Remove all frog pressure. Many horses will lengthen their stride as soon as these shoes are applied. If the " waisting " of the wall is at all marked hoof section, using a Hitchin's saw, often will give spectacular results. I can recall two show jumpers which were relieved completely and almost immediately by these means. Both cases were confirmed by X-rays. One was a very renowned horse in the British Olympic team. It was brought to us three or four weeks before Wembley. It was " dead " lame; the diagnosis of navicular disease was confirmed by X-rays. It was able to resume training and was one of the British " star turns " at the Games. Press photographs taken at Wembley when the horse was going over a jump show the shoes and the grooves quite distinctly. The other subject, also a show jumper, belonged to a relative of a veterinary friend of mine. The hoofs were grooved and shoes applied. In a few days it was competing again. As in pedal ostitis I like to use cod-liver oil. I also like to apply a piece of " Numdah " felt, retained by hoof iron, to the sole for a week or two. This felt pad is kept saturated with castor oil.

Synovial Pain.—A very troublesome form of lameness is met with occasionally in young horses when they are first put to work. It is troublesome, for clinically there may be no evident abnormality to which one can apportion the blame and further the lameness may be shown in one leg one day and in another leg the next. I believe that the pain may be centred in the synovial membranes of a joint or even of a tendon. In many ways the condition in its manifestations resembles " rheumatism." In man certain forms of " rheumatic " pain have some association with a septic focus. The focus may be extremely small and give rise to no local or gross systemic signs or symptoms. For instance, a small focus in a tonsil or at the apex of the root of a molar tooth may be the starting point of a spinal arthritis. If the offending area can be located and cleared up the secondary arthritis will resolve and often with dramatic rapidity. I believe that in like manner many of the obscure lamenesses of young horses may be secondary to some present or previously active septic focus. Strangles infection may be a prime factor. The submaxillary glands often remain quite large for a long time after acute symptoms have resolved. It may be that almost microscopic lesions do remain for a long time and only resolve completely when the animal's bodily resistance has been restored fully. Undoubtedly some tendon lamenesses are associated with brucella infection. Blood tests may be positive and the administration of an appropriate vaccine often leads to cure. Blood tests sometimes may give positive evidence of streptococcal infection. The clinical history of these cases resembles that of an infection, for if these animals are kept in a high state of nutrition, or if they can be turned out on to new spring grass, the lameness will pass away gradually. In short, as body resistance is stepped up so does the cause of synovial irritation lose its power. Other signs which point to some interference with local nutrition are the changes which can be noted in the horn of the hoof; the thinner parts, *i.e.*, quarters and heels; do not grow as fast or as well as the toes and X-ray examination may reveal defects in the centre of the weight-bearing articular areas of the interphalangeal joints. These lesions in articular cartilage may be of pin-point size, but they often communicate with a carious or rarefied area in the bone below. The best line of treatment in my view is not to be in a hurry. Feed well and give gentle and regular exercise to stimulate local blood supply. If blood tests do implicate some germ give a course of the appropriate vaccine. As a rule, if one can ensure a high state of nutrition the symptoms will pass in a very short time.

Laminitis.—The acute form of laminitis is described so well in our standard text-books that it needs no words of mine, but there is another form which starts in a chronic or sub-acute form and which may progress so that in its

final effects, *i.e.*, severe lameness, it resembles the well-known acute disease.

Now horses affected have not been at the corn bin, they have not been subjected to excessive work and they have not been parturients. Horses at grass are the victims, in wet luscious grass years, and, strange to say, when the grass has lost its lusciousness in the late summer or early autumn. The more clover there is in the pasture the greater the risk. All the animals that have come under my observation have been greedy feeders and in gross bodily condition. Ponies are more frequently affected than are the larger types. The first signs to be noticed are that the gait will be slightly cramped. There does not appear to be much pain. If noticed at this stage a couple of days' starvation in a loose box will put matters right. I have noticed that after such treatment they can be put back on the same field, they can stuff themselves as much as they like and yet a repetition of the attack is very unlikely during that season. It is as if a mild attack may confer some immunity. If a case is not caught in the early stage it may progress so that on superficial examination it resembles an ordinary acute laminitis. The animal will have its fore feet stuck to the ground, be completely immobile and may have great difficulty in grazing. It differs from acute laminitis, however, in many ways. There is little heat, no undue arterial pulsation, the feet grow rapidly but do not show the typical laminitic rings, the sole does not descend but exfoliation of horn is excessive. In one of my own animals which has repeated seasonal attacks, when this excessive mass of horn was removed a new sole of good soft horn was revealed. What is the exciting cause of this condition? The ordinary acute laminitis has generally some obvious causal factor, traumatic, infective or dietetic. In this condition which I am describing no such positive factors are at work; the animal is at grass on soft ground and generally living under conditions such as one would recommend as curative for ordinary sub-acute or resolving acute laminitis. Is the exciting cause some constituent of clover? I know from experience that clover is not the entirely beneficial food that it is generally reputed to be. Quite often broken wind is associated with a diet too rich in clover, clover in the field or even in hay. I have seen more cases of broken wind in recent years than I care to mention, especially in riding school horses where the owners have fed strong clover hay with the idea that in some way it will make up for the protein which they miss due to shortage of grain. I have no specific biochemical information at my disposal by way of explanation. My observations are based simply on the empirical standards of cause and effect. This conception is so strong that I do not hesitate to advise withdrawal of clover and the substitution in the diet of meadow hay or even straw. Whilst on this point is it not remarkable that horses keep so fit on what a few years ago would have been considered to be a completely inadequate diet? How many thin horses do we see nowadays? I have great difficulty in getting thin horses for dissection.

One type of fore-limb lameness which I have observed on a few occasions is, I am sure, connected in some way with functional abnormality of the heart and arterial system. The animal will be uneasy on his legs even when at rest. Every now and then he will raise the affected leg and flex the fetlock and knee as if in pain. When brought out he will move quite well, but after even limited exercise lameness will be pronounced. After a short rest the sequence of events will be repeated. There may be no recognisable clinical anatomical changes in the limb or limbs to account for the trouble. I have noted also that this type of lameness affects the off foreleg most frequently. Examination of the heart may disclose a duplicated first sound indicating a loss of ventricular synchronisation; there may be a systolic murmur and there is always an accentuated second sound which may indicate some increase in arterial tension. The palpable arteries in the limb are tense and full and the beat may be out of time with that of the heart. There is also an irregularity in the pulse. Not only is its timing erratic, but the force of the beat varies—sometimes it is quite hard, at others the reverse. I have considered that this form of lameness may resemble that which is associated with intermediate claudication in man It may be excited primarily by some nervous dysfunction. This contention gains support from the fact that drugs such as aspirin, which calm down the sympathetic system, do have a temporary beneficial effect. It may be that if one could devise a method of performing sympathectomy permanent relief would be afforded.

Surgical Shoeing

The title of this paper makes mention of surgical shoeing. So far, I have not made specific reference to this topic and it is time the omission was repaired. It is generally accepted that bad shoeing can ruin a good horse, but the converse is true also: a good farrier can make many lame horses to go sound. Horses' feet were never intended or designed to wear iron. In the natural state the effects of wear are sufficient to keep the feet in good shape and order. The commonest abnormalities in unshod feet are that the heels may wear unduly and the toes overgrow. It was the exigencies of military service that led to the invention of protective shields for horses' feet and to the evolution of the iron shoe. Shoeing of horses revolutionised the military arts beyond all previous comprehension. Now, although the iron shoe is much more resistant than horn to the effects of wear and tear, it does wear, and the results are registered on the shoe and in the same areas as they would have been had the foot been bare. Structural and functional defects in the limbs produce their marks upon the shoe and an observant man can read much about the state of a limb when he examines a worn shoe. Lameness is a deviation from the animal's usual or normal action. It may or may not be an indication of pain. It is a manifestation of an interference with normal physiological function. The cause of that interference may be purely mechanical or it may be active disease. Lameness always makes its mark upon the shoe. That mark—as, for example, in the case of spavin—is often specific.

Horses go best in a partly worn shoe, for by the time that wear has been registered the foot has accommodated itself to any anatomical or physiological abnormality in the limb. The worn shoe tells us how to shoe the horse next time in order to ensure his comfort and efficiency. It is rare for a shoe to wear level even on a so-called normal foot. I think that you will find that the shoes on sound feet generally wear most at the outside or inside toe regions. So if we are to shoe horses intelligently, all shoeing is "surgical shoeing." Previously I have ventured the remark that by judicious "manicuring" of the hoof we can influence the growth of horn and control its shape. The wear on the shoe tells us how to prepare the hoof just as it sets the correct pattern for the new shoe.

So the first precept in an attempt at surgical shoeing is to make a critical examination of the old shoe. Next observe the action of the foot at the walk and trot and then look for any pathological and anatomical changes in the limb.

There are no hard-and-fast rules as to how one should shoe any particular case. Each case has to be judged on its own merits. If I had to give rules or directions I would say that there are two points to bear in mind. First, relieve pressure and tension and, secondly, use the shoe to compensate for restriction of action.

This is best exemplified in the shoeing of the tender dropped sole which follows on laminitis. Shoe wide to give plenty of cover, seat well to keep pressure off the tender sole, thin the toes and heels, so that the foot rocks over on the shoe and compensates for restricted movement in the corona-pedal joint, thus stimulating the circulatory flow.

Some lesions such as ringbone and pyramidal disease, in which new adventitious bone or fibrous tissue around the articular areas interferes with normal free movement, can be compensated for by alterations in the shoe. This loss of articular movement alters the gait of the horse, alteration in gait leads to a change in function of the part. In time the foot will accommodate itself to this and in the process we may observe great changes in shape. In ringbone the heels are apt to wear unduly and the pastern to lose its slope and tend to the upright position. This latter change may be so marked that the length of the leg between the ground surface and the highest fixed point of the column of bones, *i.e.*, the olecranon process, may be increased as much as 2 inches. Sometimes this interference with normal action may be purely mechanical, but it is often associated with pain. Now, with I think the exception of spavin, mechanical interference does not register the effects of wear on a shoe as much as is the case when pain is a potent factor. Even in ringbone much of the restriction of movement in the interphalangeal joints can be compensated for by attention to the shoe. Thin the heels and the toe and thicken the branches at the quarters. In other words, try to copy what nature has done in the old worn shoe. Sidebones may lame a horse. They interfere with the normal expansion and contraction of the hoof at the quarters and heels. If the horse has a good-shaped open foot sidebones seldom cause trouble for the hoof has room for compensation. If we examine the shoe we will find that it wears unduly at the quarters. If we widen the shoe at this site we lengthen its life, and the bearing being distributed over a wider area, concussion effects are distributed and thereby absorbed. If the hoof be nipped in, and the quarters tend to be straight, hoof section enhances the results. I have seen many lame horses go sound and free within a few minutes of this operation plus the fitting of the above-mentioned shoe.

Horn tumour and pyramidal disease often respond to the use of surgical shoes. Lower the toe of the foot, dump the toe of the shoe and relieve the bearing surface at the toe so that a worn penny can be inserted between iron and horn.

Brushing is associated with defects in conformation; it will occur also in a horse when he is tired or debilitated. The latter is probably the commonest cause. We can do much to correct this defect. Pin-toed horses rarely brush, so attempt to reproduce this conformation. Set the shoe in at the quarter; more important still, deepen the inner webb. Corns cause much trouble and lameness. The remedy is simple—relieve pressure, and the best way to do this is to put on three-quarter shoes. Spavin makes its mark in the shoe long before we can recognise it clinically in the hock. I always suspect spavin when I hear a horse, which is not tired, clicking its hind toes. The shoe wears at the toe. The quarters and heels may show no signs of excessive wear. The shoeing remedy is to shorten the toe of the hoof and thicken the shoe towards the heel. This will compensate for diminished flexion in the hock. A useful aid in the ambulatory treatment of spavin is to apply "Bier's" hyperaemic treatment above the hock. This can be done by means of a cycle inner tube: apply the rubber for about half an hour morning and evening. How the effects are produced is debatable: we know that hyperaemia does diminish or deaden pain. It certainly works in the case of pain in the hock and I have known occasions when it has relieved the pains of ringbone.

This paper has become far too long. If I go on I will stifle discussion and so at this point I beg your leave to desist. I hope that I have said enough to make you talk and I hope to get much information from you, for my poor effort has only scratched the surface of a most intriguing subject.

DISCUSSION

Mr. A. H. Andrew, who opened the discussion, congratulated Professor McCunn on his excellent paper. He had the gift of being able to assess the nature of the condition presented to him and his logical conclusions as to prognosis and treatment were very impressive. The old method of student assistantship, by giving actual practical experience, had great value in teaching the diagnosis of lameness and the handling of patients and clients.

Mr. Andrew considered there were three factors which had a great influence on lameness, *viz.*, conformation (including straight action), type of work and shoeing. Therefore a horse which was technically sound on examination but of poor conformation might be quite unsuitable for hard work. He agreed with Professor McCunn that the heavy work horse was weaker in its feet, often as the result of following the method of shoeing for show purposes and the promotion of the large flat foot. The natural pony breeds were particularly sound animals with a tough hoof and arched sole—with regard to shoeing a flat foot he thought the frog protected the soft structures and should be allowed some ground contact, otherwise it would atrophy. At the same time Professor McCunn's remarks on the piston effect of the frog seemed logical.

Regarding spavin, he had not observed it in the cow as described by Professor McCunn.

With reference to the slope of the pastern, he had been taught that the pastern, with the foot, should make a line at an angle of about 45° with the ground and in shoeing the foot should be trimmed accordingly. In cases of pedal ostitis he agreed one should raise the heels and shorten the toe.

In his experience, most cases of navicular disease had a contracted hoof; raising the heel avoided pressure. The description of the horse's action as going "like a cat on hot bricks" was descriptive of navicular. Contrary to the opinion expressed by Professor McCunn, he considered sidebones did cause lameness by pressure within the wall of the hoof and on the pedal joint: hoof section was useful in giving relief. Joint and bone lameness in young horses might be due to mineral deficiency. Streptococcal and brucella infections were possible causes of some tendon lamenesses. The laminitis in horses at grass described by Professor McCunn might, especially with fat ponies, be a cumulative effect of over-rich pasture and might not show itself till late summer. Regarding the provoking of broken wind by feeding clover, both clover and sanfoin were more difficult to harvest and were more apt to make mouldy and dusty hay which he found to be a common cause of the complaint after prolonged coughing.

The degree of wear shown on the shoe varied with the type of work; a fast trotter wore his heels, a saddle horse wore the shoe fairly evenly and a draught horse at the toe. Young animals wore their shoes much less than old and required careful fitting to prevent cutting and brushing. In the treatment of lameness the type of work should be considered. A transfer to lighter or slower work would prolong the animal's usefulness, *e.g.*, a cart horse with sprained tendons or foot trouble would be better on a farm.

Luxation of the patella had not been mentioned. He had met with three types of this:—

1. In foals at birth, often accompanied with excess of fluid in the joint. The patella slipped out and in during movement. This probably was a hereditary weakness and the affected animal never became serviceable for ordinary hard work.

2. In the two-, three- and four-year old, often after a debilitating disease, the patella became fixed on the upper part of the outer trochlea, putting stifle and hock joints in a state of extreme extension. The bone had to be manipulated back and he found a high-

heeled patten shoe, support in slings where possible, and blistering the stifle region was successful.

3. Where there was rupture or injury to the patella ligaments usually from a fall, hunting or steeplechasing.

He asked Professor McCunn's views on this.

Professor McCunn, having thanked Mr. Andrew for opening the discussion, expressed agreement with his implication that the modern graduate lacked practical knowledge. In his opinion the modern system of instruction was at fault. There was far too much standing, talking and watching and not enough bending and doing. The cell had become more important than the animal. Gone were the days when the newly fledged graduate could be left to perform, with safety to himself and his patient, those tasks which were the customary everyday duties of the average practitioner.

Good judgment as regards conformation was more important than a profound knowledge of many structural abnormalities. Illustrating this, Professor McCunn spoke of two neighbouring studs of commercial horses. In one, all new horses were subject to examination and were certified to be sound and suitable for the work required of them. In the other the owner relied on his own judgment, *i.e.*, "his eye for a horse." The horses in the latter stud worked harder than those in the former but in spite of this the average working life was three years longer.

As regards the frog, he thought that the protective and anti-concussion function of the frog was overstressed. A large frog was not necessarily of benefit. It was good for picking up nails and other foreign bodies. It was the quality of the frog which mattered, not its size. In navicular disease the contracted blocky hoof was an outward manifestation of nature's efforts to effect relief. For lasting wear he preferred a horse with a rather upright pastern. He had been told that the late Professor McCall subscribed to this view and he could not think of a greater authority than that grand old man. With reference to synovial and joint troubles, Mr. Andrew was probably correct in regarding some deficiency factor, probably mineral, as a likely cause. We did know that an upset in the CA/P balance could initiate bone and joint changes, and that troubles in the synovial sheaths of the tendons often cleared up completely when horses were turned out to grass, especially to spring or early summer grass. The laminitis he had described was often insidious in onset and slowly progressive, as if it was cumulative. The type of case he had described was not on lush grass and, moreover, an attack which was treated and resolved seemed to produce some immunity against further attacks in that particular year. He considered that clover hay was not without danger, and instanced certain troubles, such as broken wind, which seemed to be associated with the feeding of clover and clover hay.

One of the troubles in the modern working stud was its small size. When the bulk of transport was horse drawn studs were big and the work could be allocated according to the physical efficiency of the units. Now every horse had to be almost 100 per cent. efficient. The speaker made reference to a series of cases of severe strain of the hind fetlock joints in a stud of corporation horses. Many were disabled. The cause was found to be the reaction of the men to the change from old-fashioned dust carts to the modern "Pagefield system" of dust collection: to sabotage the new method the men screwed the brakes up tight on the new containers. He thought that many cases of luxation of the patella were due to weakness of the quadriceps muscle associated with general debility and not to pathological changes in the joint structures *per se*. In some cases of chronic gonitis the semilunar cartilages were injured or showed signs of wear. He had met with two cases in which these cartilages were absent and the late Professor Macqueen had told him that he had observed the same strange feature.

In young horses there was often great excess in the amount of synovial fluid in the stifle joint: the distension could be very great. It was his experience that these cases responded well to aspiration. In one case he removed four and a half pints of synovial fluid. This case responded to a single tapping.

In reply to Mr. Gibbs, who asked how soon after grooving the feet a horse with navicular disease could be jumped again, Professor McCunn said that in the case in question the animal was worked and jumped the same day.

Mr. Powell asked about the relative incidence of lameness in the different breeds, stating that, for example, foot lameness was rare in the pony, cart horses were subject to ringbone and sidebone, and hunters to navicular disease. At what age should shoeing commence? Cart horses at five years were often clean limbed, but at seven years they might have ringbone: was shoeing a cause?

Professor McCunn, replying that the relative absence of foot lesions in the pony was due to the fact that they still had a natural foot, referred to the observations on this point he had made in his paper in relation to the feet of cart horses and hunters. He would like to ask the members a question. Why was strained tendon, etc., more lethal to future prospects in a flat racer than to those of a steeplechaser?

Mr. Andrews suggested that in "chasers" the suspensory ligament tended to suffer, whereas in flat racers the strain was on the flexor tendons.

Mr. Offord asked if the navicular shoe was seated. He said that in brushing the inner side was inset and deeper than the outer. Did Professor McCunn advise a calkin?

Professor McCunn: In navicular disease the branch of the shoe should be narrow but not seated. There should be a gradual rise to the heel but no calkin.

Dr. Tom Hare said he was deeply interested by Professor McCunn's family reminiscences showing that the conformation and large flat feet of the Shire horse were familiar to experts in the latter part of the nineteenth century. Professor McCunn appeared to have wide support among the profession for his condemnation of the large flat feet which had resulted from selective breeding. When and why did this selective breeding begin? From records of the work and opinions of his great-grandfather, Joseph Hare, of Gosberton, Lincolnshire, he gathered that with the development of arable farming in the Fens, during the first half of the nineteenth century, a demand arose for heavier horses to haul heavier loads. This economic demand set breeders the problem of devising a heavy horse which would haul over the peaty fenland without sinking to its hocks. The successful breeders were they who overcame the difficulty by producing the Shire horse with large flat feet. On the losing side was Joseph Hare, who steadfastly adhered to the Suffolk Punch with normal feet. This record of a controversy in the Fens amplified Professor McCunn's reminiscences; together they seemed to imply that selective breeding of the Shire horse for large feet had continued for about a century and that it was done to supply an economic demand.

At this stage, Mr. Offord exhibited examples of ox shoes which were in daily use near the Franco-Spanish border, and described the methods of shoeing.

Professor McCunn said that the farrier at the Veterinary College had shod oxen for him. The nails were not "clinched," but simply twisted up at their exposed ends.

Miss Welch enquired about splint lameness and as to what type of wear the shoe showed. She suggested that spavin might be due to strain on rising or slipping.

Professor McCunn agreed that slipping might be a cause of spavin in cows. Cows were subject to a form of arthritis of the hock which occurred in the autumn after a dry summer. He thought that the cause might be some nutritional factor. The cases resolved when the animals were given cod-liver oil. He did not consider that splints caused much lameness. There might be evidence of pain if one pressed a splint, but one must remember that splints were constantly pressed by all and sundry and the apparent painful reaction might be only a conditioned reflex. He had noted that in those cases in which the splint did cause lameness the horse went just as lame on a soft surface as on a hard one. This might be associated with the greater use of the flexor tendons. A horse lame with splint tended to catch its toe when going uphill. The same applied to pisiform trouble. There could be no doubt that in the early stages when the periosteum was being stretched local pain was present. As regards the wear on the shoe, this tended to be in the mid-toe region.

BRITISH PROGRESS IN CHEMISTRY

In the course of a recently delivered Dalton lecture to the Royal Institute of Chemistry at Manchester, Lord McGowan said that chemotherapy had introduced a new and great era of medicine and a substantial amount of the epoch-making work had been done by British chemists. In the last decade, with the development of the sulphone group of drugs, a dramatic advance in the treatment of leprosy and malaria, the two most devastating diseases to which man was heir, had been recorded, and it was with pride that he called attention to the major contributions of British chemical research in this field.

Referring to soil fertility, Lord McGowan said that in some parts of the world the use of new drugs in combating disease, combined with the devastating efficiency of new, cheap insecticides, might be so successful in undoing the natural check on population as to raise new and urgent feeding problems in days to come. There was all the more reason, therefore, for farmers to use the new weapons and techniques which chemical science had provided for them to grow more food.

OBSERVATIONS ON THE FREQUENCY AND SEX RATIO OF DEXTER "BULLDOG" CALVES

BY

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There is a fairly extensive literature on the pathology of the achondroplastic Dexter "bulldog" calves (see Crew, 1922, 1923, 1924, and Landauer, 1931), but comparatively little data on their frequency or sex ratio. The purpose of this paper is to provide some information on these points, so that the current genetical theory regarding these calves may be tested.

Wilson (1910) studied the history of the Dexter breed and records the earlier knowledge on the "bulldogs." He was the first author to give a partial explanation of the genetics of the condition. Crew (1923) suggested that the exhibition-type Dexter was heterozygous for a semi-dominant gene which, when homozygous, produced the "bulldog" calves. The normal allele of this gene when homozygous produced long-legged Dexters very similar to Kerry animals (Kerry-type Dexter). Mating Dexter to Dexter should, therefore, produce 25 per cent. long-legged Dexters, 50 per cent. Dexters and 25 per cent. "bulldogs." He records the following figures submitted to him by herd owners:—

Total Births	*Normal Calves*	*"Bulldog" Calves*	*Proportion of Abnormal Calves*
646	530	116	17·8 per cent.

This gives a chi-square, on the expectation of 25 per cent. "bulldogs," of 17 which is highly significant (P=·001), so that the proportion of "bulldogs" is significantly smaller than expected on the above hypothesis. To account for this discrepancy, and also for contradictory reports from breeders, Crew postulated the existence of modifying genes.

1. *Study of two herds in which full records of progeny type were made.*

Data from two herds, designated A and B, in each of which both Kerry-type and Dexter-type bulls were used, are reported. The records of Herd A cover 1942 to 1949; those of Herd B, 1934 to 1948.

In these herds the progeny of the different matings were classed by eye as either long- or short-legged. Both herd owners state that, in the great majority of cases, a correct classification can be made at birth.

In Herd A there have been four matings, and in Herd B ten matings of long-legged animals × long-legged animals. All the calves born were long-legged, as expected.

When long-legged animals are mated × short-legged, according to Mendelian expectation half the progeny will be short-legged, and half long-legged. No "bulldogs" would be expected. From 50 such matings in Herd A, 21 long-legged calves and 29 short-legged calves were born. The chi-square on the above expectation is 1·3 and P=0·25. From 56 such matings in Herd B, 33 long-legged and 23 short-legged animals were born. The chi-square on the same expectation is 1·7 and P=0·2. Thus in each of the two herds the result is in keeping with Crew's hypothesis.

In the two herds considered together, from 106 short-legged × long-legged matings, 54 long-legged and 52 short-legged calves were born.

The heterogeneity chi-square is 2·96 with a P = 0·08 which, although not quite reaching the level of significance, is small enough to permit one's thinking that the classification might have been biased in favour of short-legged calves in one herd (A) and of long-legged in the other (B).

Table I gives the results of mating short-legged × short-legged animals. Here, according to Crew's supposition, 25 per cent. of the calves should be long-legged, 50 per cent. short-legged and 25 per cent. "bulldogs." The chi-squares have been calculated on this expectation.

Table I.—Calves Born from Short-legged × Short-legged Matings

	Long-legged	Short-legged	"Bulldogs"	χ^2	P
Herd A ...	15	13	7	5·8	0·02
„ B ...	6	15	5	1·1	0·3
Herds A + B	21	28	12	2·9	0·10

The heterogeneity chi-square is 4 (P=0·04). Herd A differs significantly from what would be expected on Crew's hypothesis in that there is an excess ratio of long-legged animals. The reason for this is difficult to see, since in Herd A when long-legged animals were mated to short-legged, there was a deficiency of long-legged animals. It is possible, however, that both these observations are due either to sampling faults or to misclassification of type. With the small numbers involved, even one or two such errors could make considerable difference to the results. For example, if in Herd A two of the 15 long-legged animals were really short-legged the chi-square would be 2·7 with a P of 0·1, and there would be no significant deviation from expectation.

The data, considered as a whole, may be said to lend support to Crew's hypothesis. In view, however, of the significant deviation from the expected ratio in the progeny of short-legged × short-legged matings (Table I), there must be some doubt regarding the accuracy of these observations here recorded.

2. *Study of a herd where the occurrence of "bulldog" calves was noted, but where the calves born were not classified as long- or short-legged.*

Table II shows the frequency of "bulldog" calves in this herd in which only Dexter-type animals have been kept since 1931. The average frequency of occurrence of abnormal calves over 16 years is almost exactly 25 per cent. The heterogeneity chi-square based on the annual figures is 12·3 for 13 degrees of freedom, giving a P of 0·5. These figures indicate very strongly the correctness of Crew's hypothesis.

Table II.—"Bulldog" Calves Born in Unclassified Herd

Years	1931–34	1935–38	1939–42	1943–47	Total
Number of "bulldogs"	30	34	30	52	167
Total number of births ...	127	121	121	203	671
Per cent. "bulldogs"	23·6	28·1	24·8	25·6	24·8

3. *Note on the sex ratio.*

Crew (1924) reported that of the 27 "bulldog" calves examined by him, 21 were males and six females. These figures indicate a disturbed sex ratio, but since the good

fit shown previously to a 1 : 2 : 1 ratio implies an autosomal recessive, it is unlikely that it is general, and Crew's results may be due to sampling.

However, to investigate the problem statistically, a count was made of all the animals in the birth columns of the Dexter Herd Books for the years 1942 to 1947 that might have been "bulldogs," *e.g.*, those reported as "dead," "died," etc., and of those whose sex is recorded, 91 were females and 99 males. Secondly, a count was made of the sexes of the animals left after all the possible "bulldogs" had been missed out and 585 males and 564 females were noted. Whilst these methods are open to too many objections for much reliance to be placed on the findings, the results obtained do not indicate any greatly disturbed sex ratio amongst "bulldog" calves.

Summary and Conclusion

1. Breeding records from three individual herds and from the Dexter Cattle Herd Book have been examined with a view to determining the frequency of "bulldog" calves.

2. From 14 matings of long-legged × long-legged animals, only long-legged calves resulted. From 56 matings of short-legged × long-legged animals, 33 long-legged and 23 short-legged were born. From 61 matings of short-legged × short-legged animals, 21 long-legged, 28 short-legged and 12 "bulldogs" were produced.

3. In a herd where length of leg in the calves was not recorded, but where only Dexter-type breeding stock has been retained, 24·8 per cent. of 671 births were "bulldogs."

4. Indirect evidence from (*a*) total birth notifications recorded in the Dexter Herd Book minus classes of calves which might be "monsters" and (*b*) a study of the sex ratio of these classed as probably "monsters," gives little reason to suppose that the sex ratio in abnormal calves is greatly disturbed.

5. The data support, in general, the current hypothesis that the short-legged character of the Dexter breed is due to a single dominant autosomal gene which, in the homozygous state, produces the "bulldog" calves. The data do not indicate any need to postulate modifying factors.

Acknowledgments.—This investigation was made possible only through the willing co-operation of the herd owners concerned, and the author takes this opportunity of extending his thanks to them.

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ANIMALS FROM CEYLON

The consignment of animals which reached London from Ceylon last week included specimens intended for the Regent's Park Zoo, Whipsnade, Dublin and Rotterdam. They had travelled under the care of Mr. E. H. Tong, Superintendent of the Zoological Park, Whipsnade, who had gone to Ceylon specially to fetch them. Among the mammals were a cow elephant, "Sita Devi," and her calf, which have already gone to Whipsnade. Another female, "Rusty," will be used as a riding elephant in the London Zoo. She is said to be particularly good-natured. Two pairs of dwarf-cattle will go to Whipsnade after their period of quarantine. Other mammals in the cargo were a pair of leopards, two female Madras langurs, four flying foxes and three mouse deer—all intended either for Whipsnade or Regent's Park.—*The Times.*

CLINICAL COMMUNICATION

SOME OBSERVATIONS ON THE USE OF THIOPENTONE IN LARGE ANIMALS

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Soluble Thiopentone B.P.* is widely used as a short-acting general anaesthetic in small-animal surgery. It is usually administered by slow intravenous injection over a period of three to five minutes and the depth of anaesthesia assessed as the injection proceeds. Anaesthesia of ten to 15 minutes is generally obtained, recovery is free from excitement and usually complete in about two hours. By this method the dose employed is in the range $\frac{1}{8}$ to $\frac{1}{4}$ grain per lb. bodyweight, the smaller dose rate being employed for the larger animal. Owing to the cost of the amount of drug needed to anaesthetise larger animals the method has been restricted in general practice to the cat and dog, although Wright (1947) has used the method in young calves.

Longley (1950) has given a detailed account of the use of Thiopentone in the horse by the injection of a weight proportional dose in a constant volume of 100 c.c. in ten seconds. He describes 26 trials on 19 animals and gives a mathematical explanation of the dynamics of the method. Henderson (1944) had produced a state of deep narcosis in steers of 600 to 800 lb. by the rapid injection of 3 grammes of Thiopentone in 10 per cent. solution. In a later communication (1950) he explains that "rapid" means less than ten seconds, therefore his method is essentially the same as Longley's, though Henderson is careful to claim the attainment of narcosis only. He has used the rapid injection technique for the production of narcosis in several hundred cattle, but does not favour its use in the horse because of "the violence of the repeated unsuccessful attempts to rise during the period of recovery."

The object of the present study was to repeat Longley's work on horses, comparing our findings with his and extending the observations to cattle to determine whether a state of anaesthesia as opposed to narcosis could be readily produced following the rapid intravenous injection of economic doses of Thiopentone.

At this point it is perhaps opportune to make a few observations on the standards to be adopted when deciding whether or not an animal is anaesthetised. One has to make the basic assumption that any stimulus such as a pinprick which causes pain when applied to a human being has the same effect on an animal, and that if the animal responds in any way then it is not anaesthetised. In the following series of cases the injected animals were repeatedly tested with a pin and as soon as they made the slightest movement in response the condition was considered to be narcosis only.

The Horse

Six horses were dosed on eight occasions with results as in Table I. The drug, dissolved in 100 c.c. of saline, was injected into the jugular vein in periods varying from eight to eleven seconds with the horse standing. The Thiopentone solution was contained in a 100 c.c. Record type syringe, the nozzle of which could be inserted into a Record type female mounting in the end of a 3-inch length of

* The Thiopentone used was Thiopentone Sodium B.P., Boots.

rubber pressure tubing. The other end of the tubing carried a Record type male adaptor which fits the needle in the jugular vein. The use of a needle of the Middlesex type greatly facilitated injection. This needle is simply a miniature trocar and cannula and is used by piercing the raised vein, withdrawing the trocar and pushing the cannula up the lumen of the vein a short distance. The use of this type of instrument overcomes two disadvantages of the ordinary hollow sharp-pointed needle. There is no risk of a punched out piece of skin blocking the needle and movement of the animal does not readily cause the needle either to leave the vein or to penetrate the opposite wall.

Table I

Horse	Age in years	Weight in lb.	Dose in grammes	$\frac{D}{W^{\frac{2}{3}}}$	Duration of anaesthesia in minutes	Time to recover in minutes
Micky	1	630	6	·082	10	74
Minnie	1	600	5	·070	7	46
Punch	1½	650	5	·067	8	35
Bonny	14	1,606	9	·065	7	50
Berry	13	910	6	·064	7	41
Judy	1½	836	5	·056	7	40
Judy	1½	836	5	·056	7	50
Punch	1½	650	4	·053	—	20

In the course of his explanation Longley shows that the dose per unit weight, $\frac{D}{W}$, where D is the actual dose and W is the bodyweight, is a function of the cube root of the bodyweight.

$$\frac{D}{W} \times \sqrt[3]{W} = K. \therefore D = KW^{\frac{2}{3}}$$

Accordingly the value $K = \frac{D}{W^{\frac{2}{3}}}$ has been calculated for each of the above cases.

It will be seen from the table that where the dose in grammes was greater than ·053 × $W^{\frac{2}{3}}$, a period of anaesthesia ranging from seven to ten minutes was obtained and the time from administration to recovery of standing position ranged from 35 to 74 minutes.

The behaviour pattern of the horses was fairly constant. Eight to 14 seconds after the injection the animal fell to the ground; sometimes the hind limbs doubled up first and the horse sank on its haunches before falling over on to its side, on other occasions all four limbs gave way at once and the animal fell heavily on to its side. In all cases where a state of anaesthesia was attained, the respirations were of the Cheyne-Stokes type, usually three to eight shallow respirations in about ten seconds, then 20 seconds apnoea, the whole cycle being repeated about twice per minute. This state of affairs usually persisted for about the same length of time as the skin remained insensitive to pinpricks. The jaws were usually stiff, but the tongue pendulous. The anal reflex was absent, but corneal and usually palpebral reflexes were present.

The first sign of recovery was generally a paddling movement of the legs, then the head would be raised, later power would return to the forelegs and if unrestrained the animal made violent unsuccessful attempts to rise. After this course of events had been observed in the first few cases and the risk of injury during recovery noted, it became the practice to apply hobbles until the animal was judged to be able to rise unaided. In the two instances where the

Table II

Animal	Age in years	Weight in lb.	Dose in grammes	$\frac{D}{W^{\frac{2}{3}}}$	Duration of anaesthesia in minutes	Time to recover in minutes
C.43	1	650	6	·080	18	140
C.48	1	500	5	·080	—	115
C.40	1½	850	7	·078	14	300
P.7	1	550	5	·074	3	234
C.51	½	400	4	·074	—	164
D.T.	10	1,800	11	·074	13	—
C.47	1	600	5	·070	6	105
P.8	1	600	5	·070	—	108
C.24	3	1,018	7	·069	31	149
C.38	2	814	6	·068	—	95
C.35	1½	844	6	·067	26	170
C.45	1	650	5	·067	9	129
C.19	3	1,148	7	·064	25	103
C.W.S.	5	1,400	8	·065	5	114
C.50	¾	500	4	·064	—	110
P.7	¾	516	4	·062	—	113
C.32	2	804	5·4	·062	—	60
C.27	2½	980	6	·061	11	193
C.23	3	1,260	6·5	·056	—	60
C.20	3	1,176	6	·054	—	50
C.31	2	927	4·8	·050	—	41
C.21	3	1,057	5	·045	—	105
M.O.5	2	1,160	4·8	·043	—	35
P.7	¾	516	2·7	·042	—	50

operation of castration was carried out, it was noticed that the spermatic cords were not completely relaxed.

Cattle

Twenty-two cattle were dosed on 24 occasions using the same technique as in the horse and a state of anaesthesia was attained on eleven occasions.

In all these cases except one, anaesthesia was not produced by a dose in grammes less than ·064 × $W^{\frac{2}{3}}$. In four cases a greater dose produced narcosis only. The interval from completion of dose to collapse varied from eight to 14 seconds. The collapse was rather precipitate, all limbs failing at the same time and the subject often falling heavily on its side. In all cases where a state of anaesthesia was attained there was, following collapse, a period of apnoea, which varied from 20 to 120 seconds. In one case this was followed by a five-minute period of Cheyne-Stokes respirations, otherwise respirations were shallow but regular. The first sign of returning muscular power was a generalised tremor, followed by raising of the head, then sitting on the breast in which position the animal remained until almost able to stand. There was a marked absence of violent struggling as seen in the horse. Restraint therefore was not applied. Time for complete recovery varied from 35 to 300 minutes. There was one casualty, a heavy ten-year-old bull, D.T. When showing signs of recovery, *i.e.*, muscular tremors and raising of the head, it was left in the care of attendants, who were instructed to assist it on to its breast if in difficulty. It was later learned that the bull lay on its side for 24 hours and then was unable to rise. It died from pneumonia nine days later and *post-mortem* examination showed degeneration of the muscles of the shoulder region of the side on which it had been lying.

Discussion

When Thiopentone is administered to horses and cattle by rapid intravenous injection the dose required is less than that required by the slow intravenous route and the cost is correspondingly lower. It is necessary to administer the calculated dose by an exact technique for the advantage of reduced cost is lost when it becomes necessary to give additional doses to obtain anaesthesia. Even when the calculated dose is accurately administered the attainment of a state of anaesthesia is not certain. It is, of course, possible to superimpose another anaesthetic such as intravenous chloral, intravenous ether or chloroform, but this adds to the cost as well as the number of manipulations to be carried out.

The particular features of the method in the horse are the period of Cheyne-Stokes respirations and the need to apply restraint during the recovery period. In cattle there was a period of apnoea following induction and recovery was relatively quiet. When first encountered the signs of disturbed respiration are somewhat alarming, but theoretically should not be dangerous, and in the present small series of cases normal breathing has always followed.

In the horse where the dose in grammes exceeded ·053 × $W^{\frac{2}{3}}$, anaesthesia was attained; in cattle ten out of 14 cases required at least ·064 × $W^{\frac{2}{3}}$ grammes, whilst the other four cases necessitated still higher doses. It appears, therefore, that cattle require a higher dose rate than horses and that the attainment of anaesthesia is less certain.

It should be noted that all animals were apparently non-toxaemic and with the exception of three, Bonny, Berry and D.T., they were all young. Whether the same rapid recovery would occur in old toxaemic animals has not been ascertained. As the dose of drug used is relatively low, presumably a partially damaged liver should be able to carry out detoxication. In the writer's opinion the doubt would be whether the respiratory centre in a toxic animal would survive the heavy stress which appears to occur following rapid administration.

Whilst anaesthetised by Thiopentone two horses have been castrated, ten cattle dehorned and one underwent a nose operation.

Summary

Thiopentone was administered by the rapid intravenous technique to horses on eight occasions and to cattle on 24.

Short periods of anaesthesia were attained on seven occasions in horses and on eleven occasions in cattle. Thirteen operations were carried out and one death occurred. The sequence of events in both species is described.

Acknowledgments.—I wish to thank Sir Jack Drummond for permission to publish these results, and also the veterinary surgeons who kindly placed animals at my disposal.

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ABSTRACTS

Sutureless Spaying of Bitches*

In the technique introduced by Flynn for the spaying of bitches a short mid-line incision is made through the abdominal skin. Forceps are introduced into the wound, the skin is pushed to one side of the mid-line and the forceps are steadily forced through the muscle and peritoneum. Curved artery forceps are passed through the wounds, the uterine horns are located, and then the ovaries, which are removed. There is no suturing, but adhesive tape is applied around the abdomen. The authors obtained satisfactory results using a similar technique on cats, but they suggest that difficulties may be experienced in locating the uterine horns owing to the fact that the surgeon is working blindly in the abdomen. They advise the use of a caponising rib spreader to overcome this difficulty. This instrument is introduced with its lips closed through the skin, muscle and peritoneal wound and then opened about ½ inch—allowing the abdominal viscera to be seen and the uterine horns to be identified. It would appear that only the ovaries are removed and that the uterus is left *in situ*.

S. W. D.

* **An Improvement on Flynn's Sutureless Spaying Operation.** Solis, J. A., Aranez, J. B., & Manalili, F. (1951.) *J. Amer. vet. med. Ass.* **118.** 95-96.

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Fermentation in the Rumen of Sheep*

1. Wheaten† and lucerne hay were fermented *in vitro* for 48 hours. Large inocula of rumen liquor, to which was added calcium carbonate as a buffer, were used. The quantities of cellulose and pentosan fractions disappearing and the quantitive fatty acids and methane formed were deter-

* **Fermentation in the Rumen of the Sheep.** Gray, F.V., *et al.* (1951). *J. Exp. Biol.* **28.** 1 : 74-82 ; 2 : 83-90.

† Wheaten hay is wheat cut soon after the flowering stage. As the grain is forming starch is present. In addition, the degree of lignification has not far advanced.

mined. Wheaten hay produced a mixture of acids in which the proportions of acetic and propionic acids were nearly the same; the relative proportions of acetic : propionic : butyric were 47 : 40 : 13. When lucerne hay was fermented they were 59 : 27 : 14. It is calculated from the quantities of substrate disappearing that a sheep eating 1 kg. wheaten hay obtains 76 g. acetic, 101 g. propionic and 39 g. butyric acids, giving a total of 236 g. When eating 1 kg. lucerne hay it obtains 136 g. acetic, 76 g. propionic and 48 g. of butyric acids, giving a total of 260 g. Comparing the relative proportions of these acids found *in vitro* with the average proportions of these acids actually present in the rumen of sheep eating these fodders, it is seen that *in vitro* results give lower values for acetic and higher values for propionic than *in vivo* results. It is suggested that the discrepancy, which is greater with wheaten than with lucerne hay, is due to the more rapid absorption of propionic acid.

2. The actual concentrations and the percentages of acetic, propionic and butyric acids in the rumen of sheep fed either wheaten or lucerne hay are given at frequent intervals over a 24-hour period following feeding. The following features can be seen: (*a*) acetic predominates in all samples at all hours, but the proportion present is greater when lucerne hay is fed; (*b*) the proportion of propionic acid increases in a wave following feeding with both feeds, but the increase is greater with wheaten hay and figures as high as 26 per cent. were found six hours after feeding. With lucerne hay the highest figure recorded is 20 per cent.; (*c*) the proportion of acetic falls as the proportion of propionic rises with wheaten hay; the proportion of acetic when lucerne hay is fed varies little; (*d*) the proportion of butyric acid present is relatively stable with both rations, representing 9 to 16 per cent. of the total; (*e*) the total concentrations are greater with lucerne hay than with wheaten hay.

The evidence concerning absorption of these acids is discussed in relation to these results and it is suggested that the wave of propionic acid which returns to prefeeding values after 24 hours can best be explained by assuming a more rapid rate of absorption of this acid. The *p*H of the rumen during these experiments was not recorded, but if it can be assumed that the *p*H decreased as the concentration increased, as is usual, then there is considerable evidence to support this contention.

A. T. C.

REVIEWS

[Kit Wilson's Cat Encyclopedia. Elliot "Right Way" Books. Published by Andrew George Elliot, Glade House, The Glade, Kingswood, Surrey. Price 6s. net.]

We have come to expect useful books from the publisher of the "Right Way" series and it was therefore with a pleasurable sense of anticipation that we opened the "Cat Encyclopedia," particularly as a good book for the average cat owner is so sorely needed. The greater was our disappointment, therefore, to find this book falling so far short of our hopes.

It is perhaps kinder to generalise rather than to itemise the all-too-numerous errors and inaccuracies which mar diagram and text. Even allowing for subject matter of low quality, is it too much to ask that at least the proof-reading might have been adequate so that we might be spared what the Oxford Dictionary describes as a "spelling monstrosity" and the unconscious humour of being told, in the section on ringworm, that "*hermes* can be found all over the body"! Also what is "favies"?

In conclusion, we can only reiterate, with regret, our disappointment and admit that we are quite unable to recommend this book.

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["Out of Step." Written and published by Arnold S. Leese, M.R.C.V.S., 20, Pewley Hill, Guildford. Price 7s.6d.]

It is tempting, but would not be fair, to ignore this autobiography of a member of our profession who, influenced by his own interpretation of the Protocols of the Elders of Zion, retired from professional work and concentrated on exposing an alleged Jewish plot for world domination, becoming a founder member of the Imperial Fascist League and editor of the *Fascist*. Few of our readers will view his anti-Semitic activities with other than supreme distaste or his treatment at the hands of the law in the martyr-light of the author.

Mr. Leese, however, remains a member of our profession, and one able to relate in a crisp and readable style the experiences of an observant well-founded veterinarian in many parts of the world. Thus of the men of the old practical school under whom he trained—Messrs. Batt & Sons, of Oxford Street, and Mr. Guy Sutton—he writes: "A good equine practitioner was rather like a specialised Sherlock Holmes, who could take in all sorts of observations whilst hardly knowing he did it, and come swiftly to a correct diagnosis or prognosis." The author is an acknowledged authority on the diseases and care of the camel and the story of his six years in India, studying surra and trypanosomiasis in relation to the activities of the Camel Corps, is as important as it is interesting. An equally vivid account follows of his experiences in a specialist capacity as Camel Officer in the Veterinary Department of the East Africa (now the Kenya) Government.

Reading Mr. Leese's vivid story of his war service under Major Hobday at his Veterinary Hospital at Abbeville in the first World War, and of his subsequent journeyings in Egypt and Somaliland prior to his return to private practice in Stamford, very happily described, we can only deplore the "political awakening," as he terms it, which, in 1926, terminated the beneficial practise of his profession.

EXPORT OF LIVESTOCK TO CANADA

The Livestock Export Group has been informed by the Ministry of Agriculture and Fisheries that, provided no further outbreaks of foot-and-mouth disease occur in Scotland in the meantime, permits will be issued by the Canadian authorities for the shipment *after* November 17th, 1951, of ruminants and swine from the Glasgow Quarantine Station. This applies to animals both from premises in England and Wales and from Scotland.

In accordance with the regulations of this country, no animal will be allowed into the quarantine station if it has at any time during the preceding three months been on premises within 15 miles of any foot-and-mouth disease infected place.

The direct shipment of ruminants and swine from Scotland, *i.e.*, shipment without passing through quarantine before export, is not yet allowed, and there is no likelihood of any such shipments being authorised before six months have elapsed since Scotland was declared free from foot-and-mouth disease, *i.e.*, six months from August 16th, 1951.

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Dollar's Veterinary Surgery: Fourth Edition.—In connection with this publication Professor J. J. O'Connor writes: "I wish to point out that on page 195, under the heading 'Morphia Narcosis in the Dog,' there is an error in the prescription given there in the dose of sulphate of atropine, *viz.*, '0·8 grain.' The dose should read 'sulphate of atropine ·08 grain.'"

NOTES AND NEWS

Diary of Events

Oct. 9th.—Meeting of the South-Eastern Division, N.V.M.A., at Maidstone (Royal Star Hotel), 2.30 p.m.

Oct. 10th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 2 p.m., to be followed by meeting of the Executive Sub-committee.

Oct. 12th.—Meeting of the Society for the Study of Animal Breeding, at the Wellcome Research Institute, 183-193, Euston Road, N.W.1, 2.15 p.m.

Oct. 13th.—Special General Meeting of the Society of Women Veterinary Surgeons, at Liverpool (Veterinary Hospital, Pembroke Gardens), 2.15 p.m.; General Meeting of the Society, 2.30 p.m.

Oct. 17th.—Meeting of the Lancashire Division, N.V.M.A., at Liverpool (Veterinary Hospital, Pembroke Gardens), 2.30 p.m.

Oct. 18th.—Meeting of the Western Counties Division, N.V.M.A., at Exeter (Imperial Hotel), 2 p.m.

Oct. 18th.—Meeting of the Herts and Beds Division, N.V.M.A., at 70, Holywell Hill, St. Albans, 2.30 p.m.

Oct. 19th.—Meeting of the Mid-West Division, N.V.M.A., at Bristol (School of Veterinary Science, University of Bristol), 2 p.m.

N.V.M.A. Committees and Council

The following dates have been arranged for the next meetings of Committees and Council, to be held in London, the Committees at 36, Gordon Square:—

Wednesday, November 7th
2.0 p.m. Veterinary State Medicine Committee.
4.0 p.m. Parliamentary and Public Relations Committee.

Thursday, November 8th
10.0 a.m. Organising Committee.
12.0 noon. Home Appointments Committee.
2.15 p.m. General Purposes and Finance Committee.

Friday, November 9th
10.0 a.m. Council Meeting.

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THE N.V.M.A. AT EASTBOURNE

(*Continued from page 627*)

The stormy weather which remained with us throughout the week, though fortunately relenting for the Friday afternoon visit to Frant, at least had the merit of maintaining that invigoration of spirit which undoubtedly reflects the impression left by the whole Congress. This was evidenced at the outset of the proceedings of the 69th Annual General Meeting on the afternoon of Wednesday, September 26th, when the President, in his address, implemented to the full his introductory assertion that the fearless expression of personal views and considered opinions is an essential stimulus to progress in any intelligent body. Despite the headway made in the control of the insidious diseases of dairy cattle, insufficient emphasis (said Mr. Hodgman) was laid upon the vital necessity to control the ravages of animal disease and increase the productivity of our food-producing livestock. Many agencies, such as local authority and State services and individual organisations, like the Animal Health Trust and various industrial firms, had contributed to the march of progress, as also had the general practitioner. The once narrow scope of private practice had enlarged enormously. Farm livestock were receiving the benefit of the most modern developments in the treatment of disease, in hygiene, in management and breeding, while small animals had assumed their just importance. Fees in private practice should be increased, but only when the veterinarian's specialised position and skill were generally recognised could a fee commensurate with the value of the services rendered be charged.

We were a small profession numerically and therefore we must publicise ourselves. The blame for lack of adequate public recognition did not lie wholly at the doors of ignorance and prejudice—the profession itself must shoulder a share. Our greatest failure had been the omission to create specialists for the border-line sciences and "for the no man's land between our accepted work and that of others interested in livestock and products of animal origin." Too often our advice had not been sought when it would have been invaluable: typical examples were the importation of fowl pest and the failure of the Gambia Poultry Scheme. Again we had, until quite recently, neglected to encourage members of the profession to undertake research in the natural sciences and we had omitted to provide the public with the veterinary services which surely were essential if our animals were to be looked after adequately under modern conditions. For instance, there should have been created within the profession a properly organised hospital and consultative service ranged alongside the general practitioner.

In his view the profession had failed to give to the public its advice in an educational sense. This neglect was the more serious because it was confronted with much activity in this respect on the part of certain animal welfare societies and commercial firms. Moreover, it had never obtained adequate public recognition for the fact that almost all of its members would treat the animals of the deserving poor either gratuitously or for a modest fee.

There had, however, been important changes of recent years that led him to hope that these omissions might yet be made good. The status of our colleagues in academic circles already had been enhanced by their inclusion within the Universities. There were new facilities for research at Veterinary Schools, in several departments of the Universities, in the laboratories of the Ministry of Agriculture and those supervised by the Agricultural Research Council, and also, in recent years, in the Research Stations of the Animal Health Trust.

Following reference to the activities of the Trust, the President stressed his opinion that a hospital and consultative service was essential if our general practitioners were to be able to maintain their independent services to the community in the face of competition from the hospitals and clinics of the animal welfare societies. Many of these societies were well administered and reasonably wealthy, and nearly all had a nicely arranged "shop window." Another urgently needed development was that the profession should assume full responsibility for the control and inspection of meat and milk. It was a national disgrace that Britain had failed to appreciate that the control and inspection of meat and milk should be carried out by veterinary surgeons. American veterinarians here during the last war could not understand our haphazard meat inspection service estranged from the control of diseases among livestock. This led the Americans to import most of their foodstuffs and the troops were warned of the dangers of our milk supplies.

We should make ourselves and our work known and, to this end, translate as much of it as possible into readily intelligible form. Our failure to develop along these lines had been due in part to a far too narrow ethical code, which must not be an instrument of narrow professionalism, but one of recognition that the care of our professional behaviour is a duty placed upon us in the interests of public welfare.

Three paths of choice lay before the profession. The most enticing and easiest of these was the tempting descent to nationalisation which, to his mind, would be equivalent to a sentence, not of death, but of bondage. "I can readily understand," said the President, "that a war-weary and devitalised people might barter their souls for the apparent security

afforded by state control. A nationalised veterinary service may appeal to the farming community, who already receive so much by way of subsidies, although they fail to appreciate it would be a step towards the nationalisation of agriculture. It is pointless to say, as is too often said, 'It can't happen to us.' It could, all too easily, as both the doctors and dentists have found out. Freedom to-day is a gift that is precious and more so than ever because there is increasingly less freedom in a world which has given up its initiative in return for the specious promises of the planners." The second possible road was the continuation of our past policy of isolation—that seemed to him to be a *cul de sac*. The third path, which the profession should follow, was to grasp every opportunity of usefulness by seeing that we provided the services for all species of domestic animals and accept our full responsibilities in adjoining territories. "The weight of a great responsibility lies on our profession and upon veterinarians the world over, but it is not by shirking our responsibilities that we can achieve our just place in the community. On the contrary, let us demand yet heavier burdens as our right and so bear them that no man and no Government can deny us our well-earned destiny."

The meeting responded heartily to Mr. Bruford's expression of thanks to the President for his "thoughtful, constructive and fearless address."

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Having confirmed the recommendation of Council that the Association should meet in Harrogate next year, in September, and commending the initial selection of Aberdeen as the venue of the succeeding Congress, the members enthusiastically elected Mr. Alan J. Wright, the well-known Macclesfield practitioner, as President for the ensuing year. Mr. Wright, who, as Mr. Hodgman reminded us, "has the happy knack of putting his finger on the spot in any debate," was also fittingly described by Mr. S. L. Hignett, in seconding his election, as "a worthy representative of that section of the profession which all but the most biased still regard as the backbone of the profession." Following upon the election of Mr. Hodgman as Senior Vice-President, came one of historic significance to the Association, as indicating the eventual occupancy of the Presidency, for the first time, by a member of the whole-time staff of the Ministry of Agriculture. This factor, allied to his own personal qualities, made Mr. A. M. Graham, Superintending Veterinary Officer, a most acceptable selection for the post of Junior Vice-President (President-Elect). The members were glad to know, also, that the Association is to have the continuing benefit of Mr. H. E. Bywater's long experience as Hon. Treasurer, while Mr. H. E. Hebeler, of Langport, was enthusiastically re-elected as Hon. Secretary, following a most helpful first year of service. The equal warmth of Mr. Frederick Knight's re-election as General Secretary represented a tribute to his worth to which the President gave expression by reference to the "efficient, kind and very helpful way" in which he has carried out his duties. Mr. Hodgman, then, on his own behalf and that of the Council, expressed regret at the departure of Mr. Neil Mathieson, to take another post (from the position of Liaison Secretary), thanked him for his efforts to make the Congress a success from the publicity angle—which he hoped would meet with their due reward—and wished him well in his new sphere.

Prior to the election of Officers, subsequent to that of the President, an intervention had been made from the chair to announce the receipt of an appreciative acknowledgment by the Lord Chamberlain of the message, relating to His Majesty's illness, sent by the President, Council and members at the commencement of Congress, the terms of which were given in these notes last week. At this point it will be appropriate to record that a message of sympathy with him in his illness, and expressive of earnest hope for his restoration to a full measure of health and strength, was sent also to Mr. Harry Steele-Bodger. It was, indeed, held most sincerely that no Congress could be complete without his genial presence with his family. At this particular meeting it was felt to be a happy conception in the mind of Mr. Gould that we should be reminded of Mr. Steele-Bodger's foundation labours in bringing into being the "Survey of Diseases of Animals" Committee, and that these, and their outcome, now drawing to a close, should be recognised by the conferment of Honorary Membership. This proposal is to go forward to the Autumn meeting of Council as a recommendation for implementation at the next Annual General Meeting.

Two most acceptable features of the meeting were the presentation to Dr. Reginald Lovell, of the Royal Veterinary College, at the hands of Lady Anne, of the Dalrymple-Champneys Cup and Medal, in recognition of his eminence as a bacteriologist and of his work on coli-typhoid group infections, especially with regard to the diseases of young stock; also the election of Dr. J. T. Edwards as an Honorary Member of the Association, following Mr. Alan Wright's recital of the outstanding features of "almost a life-time of invaluable self-sacrificing service" for the Association and its journal.

Confirmation was given to the special resolution passed on July 30th, 1947, that the name of the Association be changed in 1952 to "British Veterinary Association" be given effect to as from January 1st, 1952, while after a prolonged debate, in which the stress laid by its opponents upon the value of the experience of the gentlemen concerned, a motion by Dr. Edwards that the Article relating to the composition of the Council be amended to exclude the Past-Presidents, was defeated by a narrow majority.

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Discussion of the remaining papers before Congress substantiated fully the impression created on Monday that the allocation of a whole morning to the consideration of each printed contribution does much to ensure an informative and representative expression of opinion. On Wednesday geneticists had a wonderful time in the field under the leadership of Professor M. M. Cooper, of Wye (an ex-captain of the English rugby XV), ably seconded by Professor Miller, of the Animal Health Trust's Equine Research Station, in discussion of the theme "Genetics and Animal Breeding." Attacking "the illogical cult of ancestor worship and the adherence to the cow family system of nomenclature," Professor Cooper criticised the retention of animals for breeding in preference to more productive cows simply because they happen to have fashionable family names. The new approach to the problems of raising animal productivity inspired by the success of hybrid maize, developed through the crossing of inbred strains, the aim of which is to produce lines not so much for their individual merit but for their combining power in matings to produce commercial stock, was probably the most positive contribution genetics had made to animal husbandry.

Thursday morning's paper, on "The Natural History of Virus Hepatitis of Dogs (Rubarth's Disease)" was presented jointly by Mr. H. B. Parry and Dr. N. M. Larin, of the Canine Research Station of the Animal Health Trust, the discussion of this contribution on a condition readily confused with distemper being opened by Professor L. P. Pugh, of Cambridge. Colour photography was used effectively by the author to illustrate both pathological and histological aspects of his theme.

On the following morning, the familiar but always intriguing

subject of "Parasitic Bronchitis in Cattle" was dealt with by that most experienced exponent, Dr. E. L. Taylor, of Weybridge, the practitioner's angle then being ably presented by Mr. J. W. Bruford, of Sevenoaks. Dr. Taylor emphasised the importance of a high level of nutrition in young cattle as a preventive. Although no medicinal treatment had yet been shown to have effect, the worms were not completely inaccessible—in any event, intra-tracheal injection might have its place in the psychological field.

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There was no Congress excursion this year, it being felt, no doubt, that such free time as was available was all too short to enable members and their ladies to sample the manifold attractions of Eastbourne and its charming immediate environment. The visit to Frant on the Friday, however, not only served to some extent in substitution, but filled a yet more important rôle in the provision at the Wellcome Veterinary Research Station of a series of demonstrations in large-animal surgery, including rumenotomy and various methods of dishorning. To these were added a specialist demonstration of certain methods for the evaluation of bull semen. The programme was the more noteworthy as being wholly a display of local talent: the techniques shown were masterly and the arrangements a miracle of organisation.

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The delicacy of phrase and allusion with which Charnock Bradley so often performed for us a similar pleasant task were recalled by the delightful speech in which Mr. H. T. Matthews commended to us "The County Borough of Eastbourne," or as he put it, "the place, the people and His Worship Alderman Crofts," at the Annual Banquet on Wednesday, September 26th. Though losing the full flavour imparted to it in delivery, none should omit to read it in our Congress Number. The Mayor, in his response, did not conceal his delight that it included, for his use and that of his successors, so helpful a phrase as "elegance without flamboyance" to describe one's paramount impression of the Borough. Though circumstances rendered his absence not altogether unexpected, the large assembly were sorry to learn at the outset, from Sir Thomas Dalling, the Chief Veterinary Officer, of the inability of Mr. Tom Williams to join us, owing to an urgent meeting of Ministers. For the rest, it was largely a raconteur's occasion, though Sir Richard Haddon, Chairman and Managing Director of the *Farmer & Stock-breeder*, was factually impressive in developing his theme that "our two professions are now as one," while Mr. Alan Wright approved Sir Richard's suggestion for a closer liaison between the Veterinary Profession and the Agricultural Press, and in his welcome of the guests, also that with the Kennel Club, evidenced by the initial official representation of that body by Lord Chelmsford. Professor J. G. Wright, too, representing the Royal College, found time for impressive references to our new responsibilities consequent upon the opening to us by recent legislation of avenues of further development and service.

The remaining evenings were devoted to dancing at the Grand Hotel. The first function, the ever-popular Ladies Guild Dance, was splendidly supported and realised the fine sum of £140 for the Benevolent Institutions of the profession, while the concluding item was in the nature of a gracious gesture by the Headquarters Hotel itself and was greatly appreciated. The closing meeting was one long, well-merited paean of praise and gratitude to all those who had contributed to the success of a memorable week, in which expressions many of our overseas and other delegates participated in feeling terms. The new President was inducted with confidence in his leadership and the retiring incumbent, Mr. Hodgman, made fully aware of the deep sense of indebtedness of his fellow officers, Council and members, both for his labours throughout the year and his conduct of Congress, while acknowledgment in more tangible form was made to the hard-working Hon. Local Secretary, Mr. S. L. Hignett, and Mrs. Hignett, also to his able assistant, Major C. J. R. Lawrence, and Mrs. Lawrence.

"May this Congress be the best in our history," said Mr. Hignett, the executive genius, at its beginning. Truly, in view of the age of the Association, an imposing aim, yet many of our scattering fraternity—and sisterhood—on the Saturday well may have said, "the best in *my* experience."

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JURY SERVICE

Important Notice to the Profession

No veterinary surgeon or person registered on the Supplementary Veterinary Register can be exempted from jury service unless he or she will take the necessary action to secure exemption. In the last week alone the Registrar, R.C.V.S., has been asked by three veterinary surgeons to obtain their release from jury service. They had not performed the very simple act which would have saved both themselves and the R.C.V.S. a great deal of worry and trouble.

Liability to jury service depends on inclusion in the local Jury Book. This is compiled each year from the Electoral Register, which is also compiled each year. In such Register the names of all persons who are, on November 20th in that year, qualified and liable to serve as jurors are marked with the letter "J" on the electors' lists. The marked electors' lists are published and anybody who, by law, is entitled to claim exemption from jury service, can write to the Registration Officer; in which case the letter "J" is removed from his or her name.

Every practising veterinary surgeon or person on the Supplementary Veterinary Register should write to the Registration Officer for the area where he or she lives and claim under Section 24 of the Veterinary Surgeons Act, 1948, to have the jury mark removed from his or her name. Once the jury mark has been put against a person's name he or she cannot be released from jury service unless the under-sheriff, who has issued the jury summons, will consent to release such person. There is no obligation on him so to do.

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PERSONAL

MR. W. H. CHASE, C.B.E., F.R.C.V.S., TO RETURN TO BECHUANALAND

Although living in happy retirement at Culmstock, Devon, for some years, Mr. and Mrs. Chase have been welcome attenders at the Congresses of the Association—including that held recently at Eastbourne—and their many friends, who have looked forward to the opportunity of meeting them on those occasions, will learn with much regret of their decision to return to Bechuanaland.

Educated at Blundell's, Mr. Chase, who qualified at the London College in 1901 and took his Fellowship Diploma in 1907, as a young man went to Cape Colony. From there he transferred to the Bechuanaland Protectorate, where he had a distinguished career under the Colonial Office. He was the author of several reports, one being concerned with the poisoning of stock by ragwort and another dealing with an outbreak of foot-and-mouth disease, during which 1,000,000 cattle were immunised and the outbreak brought under control. For these and other services Mr. Chase was awarded firstly the O.B.E. and afterwards the C.B.E. When he retired 16 years ago, Mr. Chase went to live at Culmstock, where his mother, who died recently at the age of 99, was living. On her death Mr. Chase decided to return to Bechuanaland.

A PRESENTATION

At the Ilminster club room recently the Culmstock Pig Club made a presentation to Mr. Chase. Mr. H. Perry, the Hon. Secretary,

said Mr. Chase, for the past four years, had been Hon. Veterinary Surgeon to the club, during which time he had been of very great help to the members. Mr. L. Coles, the Chairman, in asking Mr. Chase to accept an inscribed silver cigarette case, wished him good health and a return to Culmstock some time in the near future. Mr. S. Richards and Mr. B. Thorne added their good wishes.

Mr. Chase said he and Mrs. Chase had been very happy in the village. He humorously described his efforts to catch trout in the Culm and said that he hoped before very long to spend a holiday in England, when he would make renewed attempts to catch them.

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Birth.—Mackenzie.—On August 21st, 1951, at Turriff Cottage Hospital, to Ena, wife of George J. Mackenzie, M.R.C.V.S., Panton House, Turriff, a daughter—Fiona Margaret.

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Forthcoming Marriage.—Clarke—Cayless.—The engagement is announced of Peter Burleigh Clarke, B.V.Sc., M.R.C.V.S., elder son of Mr. and Mrs. K. B. Clarke, of Twyford, Berks, and Barbara Grace Cayless, B.V.Sc., M.R.C.V.S., daughter of Mr. and Mrs. C. W. Cayless, of Wimbledon Common.

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R.C.V.S. OBITUARY

Cahill, Michael, 1, Earl's Court Road, Kensington, W.8. Captain late R.A.V.C., Officer du Mérite Agricole. Graduated July 17th, 1909, London. Died September 21st, 1951; aged 78 years.

French, Thomas Henry, National Institute for Research in Dairying, Shinfield, Reading. Graduated December 5th, 1942, B.Sc. (Lond.), Ph.D. (Reading). Died August 31st, 1951.

Dr. Thomas Henry French

The death of Dr. T. H. French, which occurred suddenly following return to his research work after what had appeared to be complete recovery from an illness, has come as a great blow to his colleagues, one of whom writes: "He will be greatly missed in the laboratory. He had been doing some very fine work in certain biochemical problems of lactation and the application of the new techniques of isotope research to veterinary biochemistry. His death is a very great loss to research and to the profession in general."

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S.V.R. OBITUARY

Harvey, Charles Ernest, D.V.M. (McKillip), 36, Eastmead Avenue, Greenford, Middlesex. Admitted to Supplementary Veterinary Register, November 28th, 1949. Died February 26th, 1951; aged 82 years. (Notification just received.)

Dr. Charles Ernest Harvey

Dr. Harvey, who was born at Bishops Stortford, graduated from the McKillip Veterinary College, Chicago, in the 1909 class as a Doctor of Veterinary Medicine.

He subsequently practised in Evanston, Illinois, U.S.A., until 1915, when he migrated to Perth, Western Australia, where he continued to practise until 1939. He then returned to Great Britain and became established at 36, Eastmead Avenue, Greenford. He was placed on the Supplementary Veterinary Register on November 28th, 1949.

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UNITED STATES GOVERNMENT GRANTS FOR GRADUATE STUDY IN THE UNITED STATES, 1952-53

The United States Government announces that, under the Smith-Mundt Act (Public Law 402, the 80th Congress of the United States), there are now available for the academic year 1952-53 grants in dollars to assist British graduate students to attend universities and carry on research in the United States in the following fields:—

American Studies (History, Economics, Government),
Education,
Science and Technology,
Administration and Management,
American Literature and Journalism.

The grants will be sufficient, taking all dollar resources into account, to assure that the student will be able to pay tuition, incidentals such as books and equipment, and maintenance costs to provide a reasonable standard of living.

To be eligible for an award the candidate must be a British citizen. The selecting committees will award grants on the basis of evidence as to scholastic achievement, promise and character as shown in the applications, the academic records, and the letters of recommendation.

Part of the application for an award will be the preparation of a plan for study which demonstrates that the candidate will be materially assisted in his career and will make good use of the information and experience provided by a period of study in the United States. The selecting committees will place successful candidates in institutions of higher learning, but all applicants will be requested to list, in order of preference, institutions to which they desire to be attached.

Expenses of travel between the United Kingdom and the United States may be met by travel grants administered by the United States Educational Commission in the United Kingdom, under authority of the Fulbright Act (Public Law 584). Application for a Smith-Mundt grant will also constitute application for a travel grant and will be referred to the United States Educational Commission in the United Kingdom for consideration.

Application forms may be obtained from the United States Cultural Office, Room 302, 41, Grosvenor Square, London, W.1.

The closing date for the receipt of applications is December 15th, 1951.

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LIVERPOOL UNIVERSITY B.V.Sc. DEGREE

The following results are announced of the Final Examination for the Degree of B.V.Sc. in the University of Liverpool School of Veterinary Science:—

Part I: W. P. Boyt, P. B. Clarke, A. N. Evans, A. C. W. Fairhead, D. E. Gunner, J. H. Hudson, R. H. Johnson, *, E. H. Jones, R. Kenworthy, S. Leach, J. O. Lewis, F. W. Meredith, R. L. Pryce, C. Steele, K. L. Vaughan, A. J. Woods.

Part II: W. P. Boyt, †, P. B. Clarke, A. N. Evans, A. C. W. Fairhead, D. E. Gunner, J. H. Hudson, R. H. Johnson, E. H. Jones, R. Kenworthy, S. Leach, J. O. Lewis, Rosemarie I. Medcalf, C. Steele, K. L. Vaughan, A. J. Woods.

* Distinction in Veterinary Preventive and State Medicine.
† Distinction in Veterinary Surgery and Obstetrics.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Swine Fever:

Bedford.—31, High Street, Flitwick (Sept. 29th).

Berks.—Pound Lane, Broad Common, Hurst (Sept. 29th).

Cheshire.—Ivy Farm Piggeries, Dane Road, Sale; Cote Green Farm, Ludworth, Marple Bridge (Sept. 24th).

Hunts.—64, The Avenue, Ramsey; Benwich Road, Ramsey (Sept. 24th).

Isle of Ely.—Jupps Yard, The Row, Sutton, Nr. Ely; Hermitage Farm, Haddenham; Whitehall Farm, Littleport (Sept. 24th); Tithe Barn, Littleport; Barrett's Fen, North Bank, Thorney (Sept. 27th).

Kent.—Willow Farm, Tyland Lane, Sandling (Sept. 27th); Westview, Staple, Canterbury (Sept. 28th); Hopewell Nursery, Chestnut Avenue, Walderslade, Chatham (Sept. 29th).

Lancs.—Sunnyhurst Pig Farm, Waxey Lane, Freckleton (Sept. 26th).

Lincs (Kesteven).—4, Water Street, Stamford (Sept. 22nd); Hillward, Lincoln Road, Bassingham (Sept. 24th); Spalding Road, Deeping St. James (Sept. 28th).

Lincs (Lindsey).—Cracks Piggeries at rear of Bracebridge's Library, Lincoln City; Cockings Field, Carston Road, Market Rasen (Sept. 24th); Rookery Farm, Little Grimsby, Louth (Sept. 27th).

Norfolk.—R.A.F. Station, Watton; Cross Roads, Roydon, King's Lynn (Sept. 26th); Foxtail Covert Inn, West Tofts, Thetford (Sept. 27th).

Staffs.—Croftfield, Monkhouse, Cheadle (Sept. 29th).

Suffolk (East).—Hall Farm, North Cove, Beccles (Sept. 26th); Warren Farm, Wetherden (Sept. 27th).

Suffolk (West).—Red House Farm, Norton; Street Farm, Norton (Sept. 24th); 11, St. Johns Street, Beck Row (Sept. 29th).

Warwicks.—Far Gannaway Farm, Hatton, Claverdon (Sept. 27th); Sharmans Cross Farm, Shirley, Solihull, Birmingham (Sept. 28th).

Worcs.—Grange Nurseries, Hopwood, Alvechurch (Sept. 24th); Marton Ward Farm, Abbot's Morton (Sept. 27th); Rear of 353, Evesham Road, Crabby Cross, Redditch (Sept. 28th).

Yorks (E.R.).—16, Westgate Street, Driffield (Sept. 22nd); Queen's Head Inn, Kirkburn, Driffield (Sept. 26th); Farm Buildings, Laytham Road, Seaton Ross (Sept. 29th).

Yorks (N.R.).—Billera Farm, Fylingdales, Robin Hood's Bay, Whitby (Sept. 27th); Beech House, Haxby (Sept. 29th).

THE IRISH THOROUGHBRED

The outstanding performance of Irish horses in securing the 2,000 Guineas, 1,000 Guineas, Epsom Oaks, Epsom Derby, Nunthorpe Stakes and Gimcrack Stakes, all in one season, had raised the level of Irish stock to a foremost place in the world. Mr. T. Walsh, Minister for Agriculture, last night told this to the annual dinner in the Dolphin Hotel, Dublin, of the Bloodstock Breeders' and Horse Owners' Association of Ireland, reports *The Irish Press* in its issue of September 26th.

"In recent years," continued the Minister, "the net value of horses exported has amounted to about £2,500,000 to £3,000,000 annually. This figure, of course, includes animals of the cart type and Army horses as well as thoroughbreds, but the latter are by far the most valuable part. Owing to the introduction of mechanism almost everywhere there is little hope of expanding trade in cart and Army horses. Horse racing, on the other hand, is rather on the increase in most countries, and the indications are that it will expand still further."

While the value of Irish export trade in horses was small compared with the value of cattle and poultry products, there were probably more possibilities in securing an expansion of the thoroughbred horse trade than in the other forms of production, for the reason that markets for horses could be developed in so many countries. Ireland had the great advantage in catering for such markets because of an ideal climate and some of the very best land in the world for the raising of thoroughbred stock. In addition to this, the Irish people had a natural aptitude for the work and possessed the necessary technique. The time was now opportune to utilise to the full the facilities at their disposal to expand the business.

Speaking of yearlings, Mr. Walsh said that the average price secured at the Ballsbridge Sales was in the region of about £450 or something less, while the price realised for yearlings at the leading sales in Great Britain and the United States amounted to about double that figure. This great disparity, in view of the performance of Irish horses, appeared strange at first sight. The explanation was that Ireland was offering each year too great a proportion of animals that were not well enough bred to attract purchasers. The country must aim at raising the level substantially of yearlings from the pedigree point of view.

The Minister regretted there was also a tendency for breeders when selecting mares to attach too much importance to distinguished ancestry many generations back rather than to the performance of the more immediate ancestors. Pedigree, no matter how distinguished, without performance was quite as futile in thoroughbred horse-breeding as it was in any other branch of livestock production.

Mr. Walsh was proposing the toast of the Association, which was responded to by Mr. J. McGrath, President of the Association, and by Mr. W. E. Wylie. "Our Guests" was proposed by Senator W. Quirke and Mr. Spencer Freeman, and responded to by Mr. D. Reeves, President of the Veterinary Medical Association, and Professor M. Byrne, President of the Veterinary Medical Council

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SWINE FEVER IN EAST ANGLIA

On the grounds that so much is now involved that it is wise to play for safety, Suffolk N.F.U. executive has decided (reports the *Farmers' Weekly*) to support a Ministry proposal to declare as an "infected area" for swine fever the district covered by the counties of Cambridgeshire, Holland (Lincs), Hunts, the Isle of Ely, Norfolk, the Soke of Peterborough and Suffolk.

It was stated that the Cambs and Isle of Ely branches had already asked that the order should be made and that Norfolk was likely to do so.

Mr. George Shaw, Committee Secretary, said that from June, 1949, to July, 1950, 450 suspected cases of swine fever were reported in Suffolk and none was confirmed. In the following 12 months 408 cases were suspected and eleven confirmed. From June 24th to September 22nd there were 144 cases reported and 20 confirmed.

Mr. Makens Turner said the Ministry was extremely worried at the spread of the disease, which had assumed alarming proportions.

The proposed order would involve a closing of store pig markets and movement only on a licence issued by the police.

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MEAT TRADERS' SLAUGHTERHOUSE POLICY

At its annual meeting at Margate, the National Federation of Meat Traders' Associations approved a report rejecting the concentration of future slaughtering in a few large factory abattoirs on similar lines to those in American packing houses. The wisest course for the future was stated to be a compromise between the slaughtering freedom before the war and a policy of moderate concentration in 300 or 400 slaughtering houses of suitable size. The report stated that whatever plan was adopted in future the organisation would continue to fight for the right of butchers to use private slaughtering premises so long as they could comply with modern legislation.

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CATTLE BREEDING IN THE HIGHLANDS

Hill Lands Commission Appointed

The composition of the Hill Lands (North of Scotland) Commission, which is to explore the possibilities of breeding and rearing greater numbers of cattle in the Highlands, is announced by the Secretary of State for Scotland (Mr. Hector McNeil).

The Commission will consist of nine members under the chairmanship of Lord Balfour of Burleigh, and its task will be to select areas in which schemes for development can be undertaken most profitably. It will seek the help of farmers and landowners in the preparation of plans, suggest the best methods of carrying out approved schemes, and keep them under review. The aid of other agencies concerned with agriculture in the Highlands will also be enlisted.

A special section of the Scottish Agricultural Department is to be established to co-ordinate work created by the Commission's activities, and facilities and powers of the department may be modified at the suggestion of the Commission to hasten development of lands for stock-rearing. The area with which the Commission is concerned is the hill lands and uplands north of the Highland line, from Dumbarton to Stonehaven.

The other members of the Commission are:—

Mr. John M. Bannerman, Forestry Commissioner since 1942; Mr. Alex. C. Chalmers, chartered accountant; Dr. Joseph F. Duncan, governor, North of Scotland College of Agriculture; Brigadier J. B. P. Willis Fleming, of Strathkyle, Ardgay, Ross-shire, hill farmer and improver; Mr. J. W. Hobbs, of Great Glen Cattle Ranch, Inverlochy, Fort William, who has conducted successful experiments in cattle raising on hill grazings; Sir Hugh Mackenzie, director of industrial and commercial companies.

Mr. John Mackie, of The Bent, Laurencekirk, farmer; governor, North of Scotland College of Agriculture; member, Scottish Agricultural Advisory Council; chairman, Scottish committee of the governing body, National Institute of Agricultural Engineering; and member, Agricultural Advisory Committee for Kincardine; Mr. Kenneth Murray, chairman, Royal Bank of Scotland; and Mr. Duncan M. Stewart, member, Central Agricultural Executive Committee, with, as secretary, Mr. W. W. Gauld, Department of Agriculture for Scotland.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

DDT POISONING OF CATS AND DOGS

Sir,—Referring to the letter of Mr. N. M. Black in your columns (September 29th, 1951), I can quote two cases of poisoning of dogs by DDT in powder form.

1. Seven Alsatian puppies, three and a half months, were dusted with DDT powder to destroy fleas. They were then shut overnight in a small boxroom "to shake off the powder." On the following morning all the puppies were showing nervous symptoms, incoordination and mild convulsions. All died within 48 hours of being dusted with the powder.

2. A three-year-old Cocker male developed nervous symptoms and "fainting fits" at approximately weekly intervals over a period of two months during the hot summer weather. The explanation lay in the fact that the charlady, on her weekly visit, sprinkled the front door mat heavily with DDT to keep down the flies. The excitable spaniel welcomed every ring of the bell by jumping up and down on the mat with the mouth wide open whilst barking loudly.—Yours faithfully, R. H. Smythe, 45, St. James's Street, Nottingham. *September 29th*, 1951.

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HERD INCIDENCE OF JOHNE'S DISEASE

Sir,—In to-day's *Farmers' Weekly* there appears a brief report of the discussion at the Eastbourne Congress on Dr. A. W. Taylor's paper on Johne's disease. I was disturbed to read that Mr. A. J. Wright had said: "It appeared to-day that Guernseys were more subject to the disease than other breeds," and that Mr. H. F. Hebeler confirmed this opinion.

I hope to see in these columns either a statement by these two gentlemen that they have been reported wrongly, or figures to support their opinion.—Yours faithfully, F. R. Spratling, 14 & 16, Queen's Road, Reading. *September 28th*, 1951.